National Experimental WellBeing Statistics Executive Summary

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Abstract

This is the U.S. Census Bureau's first release of the National Experimental Wellbeing Statistics (NEWS) project. The NEWS project aims to produce the best possible estimates of income and poverty given all available survey and administrative data. We link survey, decennial census, administrative, and commercial data to address measurement error in income and poverty statistics. We estimate improved (pre-tax money) income and poverty statistics for 2018 by addressing several possible sources of bias documented in prior research. We address biases from (1) unit nonresponse through improved weights, (2) missing income information in both survey and administrative data through improved imputation, and (3) misreporting by combining or replacing survey responses with administrative information. Reducing survey error substantially affects key measures of wellbeing: We estimate median household income is 6.3 percent higher than in survey estimates, and poverty is 1.1 percentage points lower. These changes are driven by subpopulations for which survey error is particularly relevant. For householders aged 65 and over, median household income is 27.3 percent higher than in survey estimates. For people 65 and over, poverty is 3.3 percentage points lower than the survey estimate. We do not find a significant impact on median household income for householders under 65 or on child poverty. Finally, we discuss plans for future releases: addressing other potential sources of bias, releasing additional years of statistics, extending the income concepts measured, and including smaller geographies such as state and county.

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1   Introduction

Accurately measuring household income and poverty is essential to understanding the nation's overall economic wellbeing. Many studies show that measurement error stemming from unit nonresponse, item nonresponse, and misreporting biases key official statistics such as mean or median income and the official poverty rate. The direction of bias differs between these sources of measurement error. Unit and item nonresponse have been found to bias income up and poverty down, while misreporting can bias income down and poverty up. These previous papers document aspects of the overall problem of survey error in isolation, so the overall impact of these error sources on the accuracy of survey estimates remains unclear.

This paper provides an executive summary the National Experimental WellBeing Statistics (NEWS) Project, a project to create the most accurate estimates of household income and poverty.[1] The NEWS project makes three unique contributions towards a more comprehensive solution to the problem of measuring income accurately. First, we address as many sources of bias as we can simultaneously, including unit and item nonresponse and underreporting in surveys as well as the various challenges in administrative data such as measurement error, conceptual misalignment, and incomplete coverage. Simultaneously addressing these error sources is crucial, since they have been found to bias key statistics in different directions. Second, we bring together all of the available survey and administrative data in order to overcome the shortcomings of individual data sources. For example, we use 5 different sources of wage and salary earnings, each of which capture earnings and jobs not on reported on others. Third, we propose a model to combine survey and administrative earnings data given measurement error in both sources, replacing ad hoc assumptions that have been used in prior work.

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[1]A more comprehensive description of the NEWS project can be found at `https://www.census.gov/data/experimental-data-products/national-experimental-wellbeing-statistics.html`.

2 Results

To demonstrate the importance of more accurate data, we estimate pre-tax money income and poverty statistics for 2018, mirroring the Census Bureau's annual income and poverty report. Table 1 and Figure 1 compare the 2018 NEWS estimates for median household income to the survey estimates released in Semega et al. (2019).[2] For all households, the NEWS estimate for median household income was 6.3 percent higher ($67,170 vs. $63,180). Median household income was higher for nearly all subgroups shown. The main exceptions, however, were by age of householder. Pooled together, median household income for households under age 65 were not statistically different (-0.1 percent lower point estimate) whereas households 65 and older had *27.3* percent greater median household income ($55,610 vs. $43,700). For households aged 55-64, the difference was 5.0 percent ($72,430 vs. $68,950). For all age groups below 55, the point estimates were not statistically different from zero or negative.

Comparisons between NEWS and survey estimates for poverty are shown in Table 2 and Figure 2. Overall, poverty was 1.1 percentage points lower than in the survey estimate, a 9.4 percent decline in the number of people in poverty. As with income, poverty was much lower for the 65 and older population — we estimate a 3.3 percentage-point lower poverty rate and 34.1 percent fewer people in poverty. There were no groups for which poverty was statistically higher with the NEWS estimates. However, we did not find a statistically significant decline in poverty for Black individuals, children, residents of the Midwest, those outside of Metropolitan Statistical Areas, those with a disability, and those with some college education.

Finally, in Table 3, we compare NEWS estimates for inequality statistics to the survey estimates, including for income shares, the Gini index, and various percentile ratios. For shares of income, we find a decrease in the share of income in the 2nd to 4th quintile and an

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[2]All estimates are in 2018 dollars. To adjust to 2021 dollars using the R-CPI-U-RS as in official Census Bureau publications, multiply each income estimate by $399.0/369.8 = 1.079$.

increase in the share of income in the top quintile and particularly the top 5 percent. We estimate an increase in the Gini coefficient from 0.459 to 0.476. This is likely coming from no top coding and higher extreme income values in the administrative data relative to the survey,[3] despite the larger increase in income at lower percentiles of the income distribution shown in Figure 3. However, consistent with that figure, we find declines in the percentile ratio estimates (90/10, 90/50, and 50/10). For example, in the survey responses, household income at the 90th percentile is 12.5 times as large as at the 10th percentile. With the NEWS estimates, the ratio is 11.5.

3 Future Goals

An integral goal of the NEWS project is to be as transparent and open about the data we use, how we clean it, and how we combine it to generate the NEWS income, poverty, and resource estimates. This is crucial for these estimates as there are many decisions about how to clean, process, and combine survey and administrative data that can have major impacts on the results and be relatively opaque and in-the-weeds for even a well-informed outsider. Transparency about our methods, code, and estimates is required for an outsider to understand the implications of those kind of detailed data choices. We commit to making as much of the data as we can and all of the code available in the Federal Research Data Center (FSRDC) system.[4] We also commit to making the code publicly available, with as few edits as possible as required by the rules on the disclosure of code to abide by Titles 13 and 26 and our agreements with data providers.

This release represents version 1.0 of the NEWS project. There are many aspects of this work that we were not able to include in this release and have left for future work. First, we have estimated income and poverty in a single year, 2018, as a proof of concept and first step

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[3]Survey income top codes vary by income item, but generally do not exceed $1.1 million dollars for a given income source.

[4]Subject to the constraints of our data agreements with the various state and federal agencies and commercial data providers.

in this work. We plan to expand this to include more years, both earlier years and years up to the present. Second, we have only estimated statistics at the national level. In the future we plan to extend the estimates to smaller geographic units, including states, counties, and possibly census tracts. Third, we have generated estimates only for pre-tax money income, as measured in the Census Bureau's annual income and poverty release (Semega et al., 2019). However, there is considerable interest in how in-kind benefits, taxes, and credits affect measures of material wellbeing. We plan on expanding the notions of resources we measure and as well as the set of wellbeing and deprivation statistics we report. Finally, there are dimensions of misreporting and measurement error that we were not able to address in this version, such as underreported self-employment earnings and income at the very top of the distribution (such as the top 0.1 or top 0.01 percent). We plan on researching ways to address these issues for future releases. As we advance the methods in future releases, we expect to revise these estimates.

References

Semega, Jessica, Melissa Kollar, John Shrider, Creamer, and Abinash Mohanty.
2019. "Income and Poverty in the United States: 2018." *U.S. Census Bureau Current Population Reports.*

Figure 1: NEWS Estimate of Median Household Income Relative to Survey in 2018
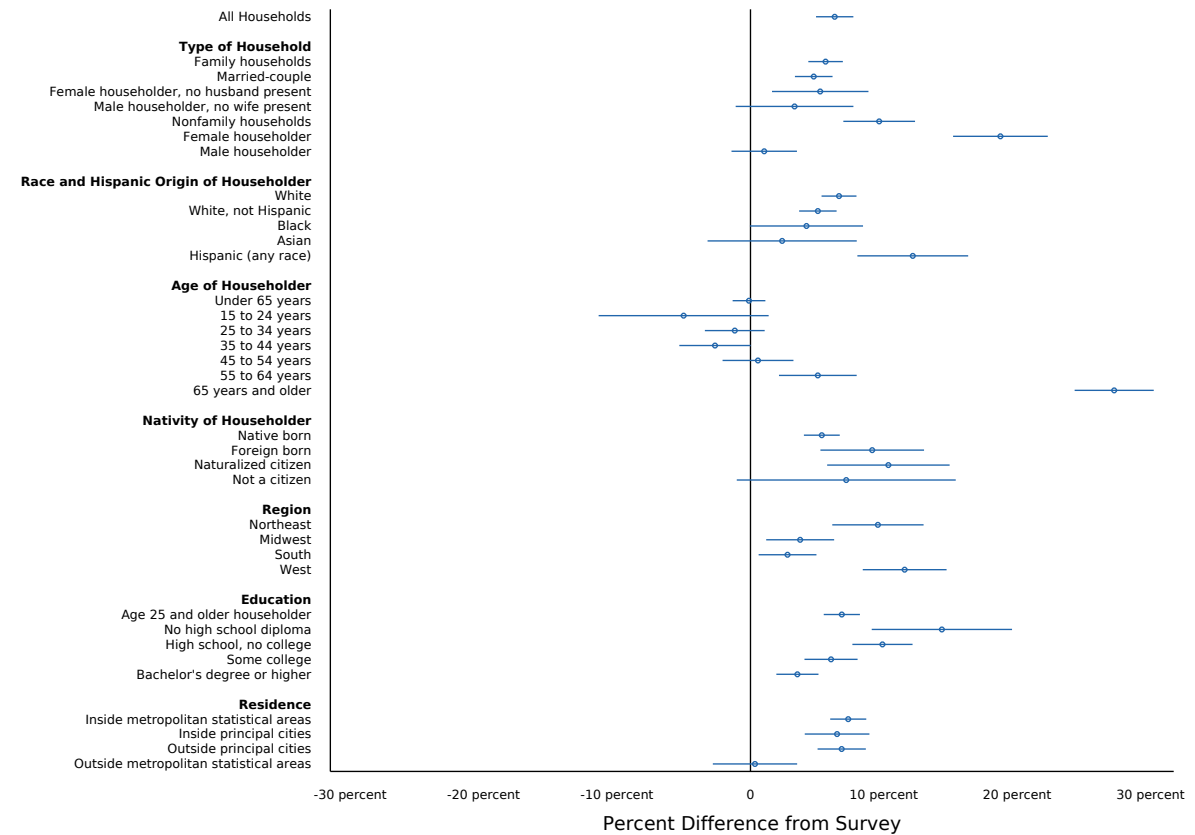
Notes: This figure shows the percent difference between the NEWS estimates of median household income compared to the survey estimates in 2018.
Source: 2019 Current Population Survey Annual Social and Economic Supplement linked to administrative, decennial census, and commercial data.

Figure 2: NEWS Estimate of Poverty Relative to Survey in 2018

Notes: This figure shows the percentage point difference between the NEWS estimates of poverty compared to the survey estimate in 2018.
Source: 2019 Current Population Survey Annual Social and Economic Supplement linked to administrative, decennial census, and commercial data.
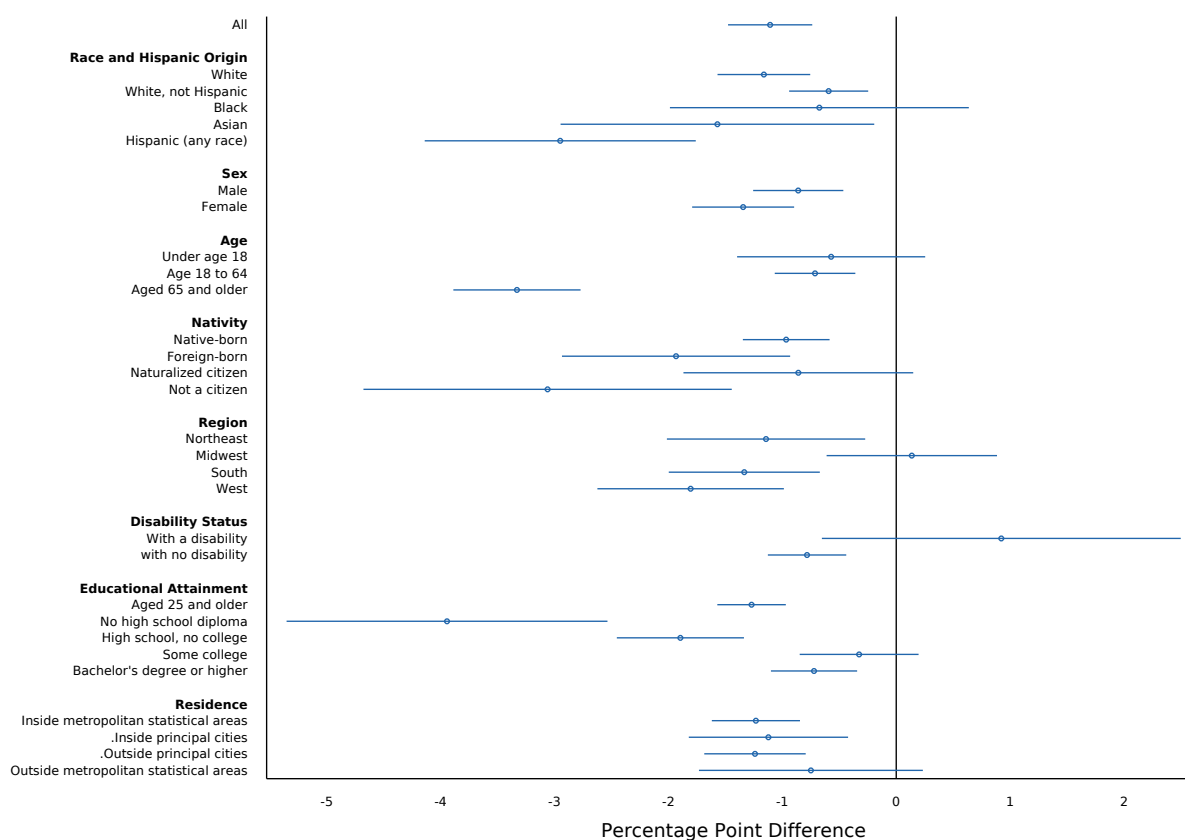
Figure 3: NEWS Estimate of Household Income Distribution Relative to Survey in 2018
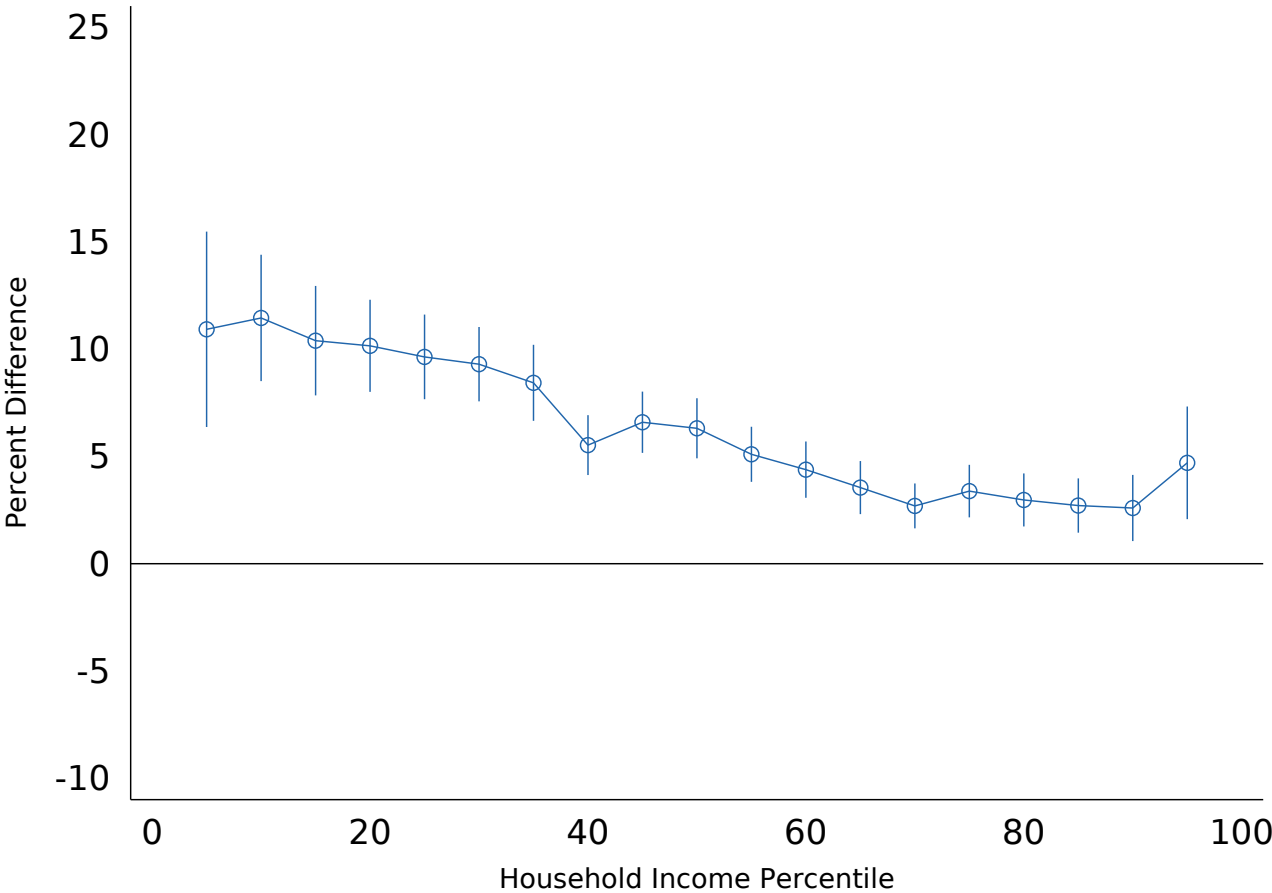
Notes: This figure shows the percent difference between the NEWS estimates of household income compared to the survey estimates across the income distribution.

Source: 2019 Current Population Survey Annual Social and Economic Supplement linked to administrative, decennial census, and third party data.

Table 1: NEWS Median Household Income Estimates Compared to Survey in 2018

Characteristic	Survey Number (thousands)	Survey Median Income Estimate	Survey Median Income 95 percent CI	NEWS Number (thousands)	NEWS Median Income Estimate	NEWS Median Income 95 percent CI	Percent Difference (NEWS - Survey) Estimate	Percent Difference (NEWS - Survey) 95 percent CI
HOUSEHOLDS								
All Households	128,600	63,180	823	133,700	67,170	962	6.3***	1.4
Type of Household								
Family households	83,480	80,660	791	85,840	85,210	1,221	5.6***	1.3
.Married-couple	61,960	93,650	1,340	63,950	98,100	1,402	4.7***	1.4
.Female householder, no husband present	15,040	45,130	1,329	15,250	47,490	1,754	5.2***	3.6
.Male householder, no wife present	6,480	61,520	1,485	6,644	63,550	2,798	3.3	4.4
Nonfamily households	45,100	38,120	983	47,890	41,800	846	9.6***	2.7
.Female householder	23,510	32,010	794	24,860	38,010	1,201	18.7***	3.6
.Male householder	21,580	45,750	1,034	23,030	46,230	1,212	1.0	2.5
Race and Hispanic Origin of Householder								
White	100,500	66,940	769	104,000	71,390	984	6.6***	1.3
..White, not Hispanic	84,730	70,640	777	87,370	74,210	1,166	5.1***	1.4
Black	17,170	41,360	1,079	18,290	43,100	2,058	4.2*	4.3
Asian	6,981	87,190	3,342	7,019	89,270	5,614	2.4	5.6
Hispanic (any race)	17,760	51,450	876	18,400	57,710	2,314	12.2***	4.2
Age of Householder								
Under 65 years	94,420	71,660	683	99,370	71,580	1,001	-0.1	1.2
..15 to 24 years	6,199	43,530	3,204	6,961	41,350	2,245	-5.0	6.4
..25 to 34 years	20,610	65,890	1,281	22,080	65,110	1,764	-1.2	2.3
..35 to 44 years	21,370	80,740	1,276	22,490	78,600	2,390	-2.7*	2.7
..45 to 54 years	22,070	84,460	2,198	23,000	84,940	2,017	0.6	2.7
..55 to 64 years	24,170	68,950	1,720	24,840	72,430	1,975	5.0***	2.9
65 years and older	34,160	43,700	972	34,360	55,610	1,370	27.3***	3.0
Nativity of Householder								
Native born	108,600	64,240	848	114,100	67,680	981	5.3***	1.3
Foreign born	20,020	58,780	1,891	19,670	64,140	2,322	9.1***	3.9
..Naturalized citizen	11,040	65,520	2,682	10,480	72,290	2,877	10.3***	4.6
..Not a citizen	8,976	51,940	1,254	9,193	55,670	4,458	7.2*	8.3
Region								
Northeast	22,050	70,110	2,247	22,840	76,810	2,876	9.6***	3.4
Midwest	27,690	64,070	1,722	28,730	66,460	1,726	3.7***	2.5
South	49,740	57,300	978	52,470	58,890	1,418	2.8**	2.2
West	29,100	69,520	1,900	29,700	77,560	2,366	11.6***	3.1
Residence								
Inside metropolitan statistical areas	110,800	66,160	725	112,600	71,010	1,049	7.3***	1.4
..Inside principal cities	42,980	59,360	1,457	43,040	63,210	1,653	6.5***	2.4
..Outside principal cities	67,810	70,930	902	69,520	75,780	1,522	6.8***	1.8
Outside metropolitan statistical areas	17,790	49,870	1,941	21,170	50,040	1,722	0.3	3.2
Education								
Age 25 and Above	122,400	64,760	806	126,800	69,200	963	6.8***	1.4
No HS	11,230	28,330	1,260	11,850	32,400	1,599	14.4***	5.3
HS	31,810	46,070	870	33,270	50,630	999	9.9***	2.3
Some College	33,940	60,940	918	35,090	64,620	1,432	6.0***	2.0
Bachelor's and Above	45,410	101,800	1,135	46,550	105,400	1,940	3.5***	1.6

Notes: This table compares the NEWS median household income estimates to the survey estimates by subgroup in 2018. ***, **, and * indicate significance at the 1, 5, and 10 percent levels and are only shown for percent differences.

Source: 2019 Current Population Survey Annual Social and Economic Supplement linked to administrative, decennial census, and commercial data.

## Table 2: NEWS Poverty Estimates Compared to Survey in 2018

Characteristic	Survey Percent	Survey 95 percent CI	NEWS Percent	NEWS 95 percent CI	Change in poverty (NEWS - Survey) Difference	Change in poverty (NEWS - Survey) 95 percent CI
PEOPLE						
....Total	**11.78**	**0.29**	**10.67**	**0.39**	**-1.11***	**0.37**
Race and Hispanic Origin						
White	10.07	0.30	8.91	0.40	-1.16***	0.41
...White, not Hispanic	8.07	0.28	7.48	0.35	-0.59***	0.35
Black	20.77	1.16	20.10	1.46	-0.67	1.31
Asian	10.10	0.94	8.52	1.41	-1.57**	1.38
Hispanic (any race)	17.56	0.80	14.61	1.14	-2.95***	1.19
Sex						
Male	10.57	0.32	9.71	0.40	-0.86***	0.40
Female	12.94	0.33	11.59	0.48	-1.34***	0.45
Age						
Under 18 years	16.20	0.67	15.62	0.86	-0.57	0.83
18 to 64 years	10.68	0.29	9.97	0.37	-0.71***	0.35
65 years and older	9.75	0.46	6.42	0.45	-3.33***	0.56
Nativity						
Native-born	11.45	0.31	10.48	0.40	-0.97***	0.38
Foreign-born	13.79	0.67	11.86	0.97	-1.93***	1.01
...Naturalized citizen	9.93	0.75	9.07	0.99	-0.86*	1.01
...Not a citizen	17.46	1.01	14.40	1.59	-3.06***	1.63
Region						
Northeast	10.28	0.66	9.14	0.86	-1.14**	0.87
Midwest	10.37	0.66	10.51	0.83	0.14	0.75
South	13.57	0.55	12.24	0.66	-1.33***	0.66
West	11.22	0.64	9.41	0.83	-1.80***	0.83
Residence						
Inside metropolitan statistical areas	11.34	0.32	10.11	0.43	-1.23***	0.39
...Inside principal cities	14.59	0.65	13.47	0.74	-1.12***	0.70
...Outside principal cities	9.42	0.40	8.18	0.47	-1.24***	0.45
Outside metropolitan statistical areas	14.68	0.99	13.93	1.14	-0.75	0.98
Disability Status						
....Total, aged 18 to 64	10.68	0.29	9.97	0.37	-0.71***	0.35
With a disability	25.72	1.32	26.64	1.66	0.92	1.58
With no disability	9.46	0.25	8.68	0.36	-0.78***	0.35
Educational Attainment						
....Total, aged 25 and older	9.90	0.24	8.62	0.32	-1.27***	0.30
No high school diploma	25.90	1.05	21.96	1.36	-3.94***	1.41
High school, no college	12.73	0.47	10.83	0.56	-1.90***	0.56
Some college	8.38	0.38	8.05	0.51	-0.33	0.52
Bachelor's degree or higher	4.37	0.32	3.65	0.33	-0.72***	0.38

Notes: This table compares the NEWS poverty estimates to the survey estimates by subgroup in 2019. ***, **, and * indicate significance at the 1, 5, and 10 percent levels and are only shown for percent differences. *Source:* 2019 Current Population Survey Annual Social and Economic Supplement linked to administrative, decennial census, and commercial data.

Table 3: NEWS Inequality Estimates Compared to Survey in 2018

Measure	Survey		NEWS		Percent Difference (NEWS - Survey)	
	Estimate	95 percent CI	Estimate	95 percent CI	Estimate	95 percent CI
Shares of Aggregate Income						
1st Quintile	0.036	0.001	0.037	0.001	0.001	0.001
2nd Quintile	0.091	0.001	0.089	0.002	-0.002*	0.002
3rd Quintile	0.148	0.001	0.142	0.003	-0.005***	0.003
4th Quintile	0.227	0.002	0.215	0.004	-0.012***	0.004
5th Quintile	0.498	0.004	0.516	0.009	0.018***	0.008
Top 5 Percent	0.218	0.005	0.252	0.012	0.034***	0.012
Summary Measures						
Gini Index	0.459	0.004	0.476	0.009	0.017***	0.009
90/10 percentile ratio	12.52	0.34	11.52	0.36	-1.00***	0.35
90/50 percentile ratio	2.92	0.04	2.82	0.04	-0.10***	0.05
50/10 percentile ratio	4.29	0.10	4.09	0.10	-0.20***	0.11

Notes: This table compares NEWS inequality statistics to the survey estimates in 2018. ***, **, and * indicate significance at the 1, 5, and 10 percent levels and are only shown for percent differences.
Source: 2019 Current Population Survey Annual Social and Economic Supplement linked to administrative, decennial census, and commercial data.